October 2011

Energy Services BULLETIN

Western's monthly energy efficiency and renewable energy newsletter dedicated to customer activities and sharing information on energy services.

Tradition, vision meet in first tribal LEED-Platinum building

The new Math and Science Building at Blackfeet Community College in Browning, Mont., shows respect for the past while laying the groundwork for a greener future—and earning the U.S. Green Building Council's highest rating.

"Ahm Ska Tos Po II Koh Kan," or the South Wind Lodge, received its designation as the first LEED-Platinum building on tribal land this summer. Blackfeet tribe members and college administrators and staff were joined by the designers, building contractor and consultants July 7 to celebrate Montana's first education facility to achieve Platinum status.

Built with U.S. Department of Education and USDA Rural Development funds, the $5-million building is 57 percent more energy-efficient than minimum standards. "Blackfeet Community College has a responsibility, like all Federal, state and municipal organizations, to take the lead on minimizing our carbon footprints," said Terry Tatsey, chairman of the college's facilities committee. "We need to be looking at the long-term effects of our choices," he added.

Simplicity first

The features that contribute to the building's sustainability range from simple, low-carbon solutions to advanced building technology. The first category includes the southern orientation of the building and five-foot high earth berms along the western and northern walls which protect it from high winds and storms. The shed-style roof and heavy insulation provide additional defense against Montana's sometimes harsh weather. High-performance windows and a passive "solar corridor" on the mostly south-facing wall make the most of the sun's light and heat.

Water conservation is a LEED category where technology is not always needed to score points. In fact, not installing a system—opting for natural landscape without irrigation—cut down on the Math and Science Building's water needs. Indoors, off-the-shelf, low-flow plumbing fixtures and waterless urinals further reduce water use.

Materials use is another category that lends itself to low-tech solutions. "We used a lot of products—wood, rock and manufactured metal—found within a 500-mile radius of the project," explained Tatsey.

The design team selected cabinetry and finishes that give off a minimum of polluting gases, while contractors diverted 83 percent of the construction waste from the landfill. Dedicated containers for easy recycling continue to minimize waste now that the building is open and classes are in session.

Energy-efficient fume hoods in classroom laboratories provide ventilation without running up electric bills. (Photo by Gordon Whirry Architecture)

Boost from technology

A building that houses math and science classes should also boast its share of modern systems and equipment, and the South Wind Lodge does. Insulated skylights and windows, automated blind systems,

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What's inside

LEED-Platinum building *from page 1*

high-efficiency lighting fixtures and sophisticated occupancy controls and daylight sensors combine to cut electricity demand.

Radiant floors, high-efficiency boilers and a heat-recovery system—all controlled by computer—heat and cool the building. Heat recovery and ventilation pose a particular challenge in laboratory space, noted Gordon Whirry, whose architecture firm was the prime architect on the project. "The lab exhaust needs make it difficult to maintain energy efficiency without good controls and heat reclaim," he explained.

Consulting Architect, Mark Headley, of Studio Forma in Bozeman, Mont., provided lab design and energy expertise needed to overcome those issues. He also led the collaborative preliminary design phases. However, more technology was not the automatic response, recalled Kath Williams, the project's LEED consultant. "They chose a basic building automation system and simple energy-efficient fume hoods, rather than 'throwing money at the problem,'" she said.

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That will save them money in the long run, Williams stated, because the more complex a system or equipment is, the more ways it can break down. "Then building owners don't maintain their energy-efficiency features, and there goes the energy savings."

Just add solar

Once the tight building shell, efficient systems and controls were in place, it was time to add the renewable energy system. A 30-kW solar photovoltaic (PV) array is supplying 14 percent of the building's energy needs. Glacier Electric Cooperative, the college's utility, worked with the team to interconnect the system to the grid.

The PV panels added significantly to the cost of the project, in part because of the steel supports needed to reinforce the array against the winds. For Blackfoot Community College, which has collaborated with other Montana schools on renewable energy trainings, the investment is another step toward establishing a permanent alternative energy program. "It will provide a lab for students to research solar power," said Tatsey. "Classes will be collecting data on the array's output throughout the year."

Tatsey hopes that the array will inspire interest beyond the school. "It would be great if it got people thinking about green housing and putting in solar/wind hybrid systems," he said.

Integrating tradition

The South Wind Lodge project offers much to inspire and educate. The architects, engineering firms and construction company were all Montana companies, and many of the construction crew were tribe members. "The project manager grew up near Browning," said Williams. "I felt a little like an outsider, coming 'all the way' from Bozeman."

Williams, who has consulted on six LEED-Platinum projects, was impressed by how smoothly this one went. "It makes a big difference when the building owner takes the lead," she said. "The Blackfeet were really committed to the integrated design process and to making sure the design team was communicating."

Part of that communication was educating the project team about Blackfeet tradition, Williams said. "We took a class on teepee design to learn about tribal symbolism, and the Blackfeet performed smudge ceremonies calling for blessings on each team member," she said.

The building's exterior design incorporates Blackfeet art motifs and traditional forms. The overhang shading the building echoes tepee poles, while the rock-walled arbor in front of the building evokes rock cairns and pishkun driving lines. Around the top of the building, a band of circles recalls constellations that would be painted on the top of a tepee. The middle layer is left blank to represent the differences among individual stories and unique student potentials. The triangles ringing the building's base are a classic design reference to everything underground and underwater in the bottom of the three spheres of the world.

The exterior decoration is a reflection of the way that Blackfeet understood the world in the past, just as the South Wind Lodge is a modern expression of the tribal way of life. "It is our belief that we should leave the world as intact as we can," Tatsey said.

For links to more resources, visit http://ww2.wapa.gov/sites/western/es/pubs/esb/Pages/esb1.aspx

Listen, learn, speak out at Rocky Mountain Utility Efficiency Exchange

What's in a name? In the case of the Rocky Mountain Utility Efficiency (RMUE) Exchange, five years of sharing best practices, resources, great—and yes, not-so-great—ideas for utility programs to save energy.

The new name for the Colorado Utility Efficiency Exchange reflects the evolution and maturity of the event, which takes place Oct. 12 to 14 at Aspen Meadows Resort. What started with a handful of utility Energy Services managers and vendor partners has grown to include community members, non-profits, work groups and energy leaders. The opening keynote speaker Wednesday, Oct. 12, is former Colorado Governor Bill Ritter, who now heads the Center for the New Energy Economy at Colorado State University.

"The word has spread beyond Colorado that the Exchange offers a great opportunity for utility and energy professionals to meet and learn from each other," said Energy Services Manager Ron Horstman. "Western has sponsored the event from the beginning because we believe that the best solutions to each region's unique energy challenges will come from the people who deal with those challenges daily."

Energy Services Manager Ron Horstman points out the importance of using energy-efficiency programs to build consumer relationships at the 2010 Colorado Utility Efficiency Exchange. (Photo by Electric and Gas Industry Association)

Things change…

Of all the challenges utilities—and the country in general—are facing, the biggest, of course, is the economy. "A few years ago, energy-efficiency program activity was really off the charts," recalled Jeff Rice, energy efficiency manager for event host Aspen Municipal Utilities. "Then suddenly, everyone decided they couldn't spend money on programs."

Recovery funding brought a rebound in interest as businesses and homeowners scrambled to make the most of incentives and rebates while the dollars were available. New local agencies and programs sprang up to help consumers connect with the products and services they needed. "In the Roaring Fork Valley alone, the number of organizations that are dedicated to energy efficiency has tripled in the last couple of years," noted Rice. "That gives utilities all kinds of new partnership opportunities we didn't have before."

More collaborative efforts have opened the door to innovative approaches, and utilities participating in the RMUE Exchange are eager to talk about what they are doing. "When we first started the Exchange, our goal was to gather as many Energy Services program managers as we could and find out what they were doing," Rice said of the early events. "Now, participants have gone from, 'What are you doing?' to 'Come work with us and see what we can do for you.'"

Great sessions remain

Attendees and speakers will have plenty to talk about, whether it is during the Utility Program Snap Shots, the sessions or the networking events. Everyone who attends is considered a participant, so come prepared to ask questions, offer solutions and point to examples.

Following Gov. Ritter's keynote, the agenda shifts into interactive mode with Focus on Utility Program Portfolios. Presentations from Xcel, SourceGas, Black Hills Energy and the Colorado Governor's Energy Office (GEO) will explore strategies, implementation and lessons learned at large organizations.

Dual track sessions are back on Thursday, forcing attendees to make tough choices. In the morning, decide between residential and commercial tracks—though similar themes may make deciding easier. In all market segments, Energy Services managers still struggle to engage consumers, connect with knowledgeable contractors and measure program effectiveness. The afternoon sessions focus on technology and collaborative partnerships. The topics of lighting, smart meters, data analytics and market transformation could show up on either side of the tracks, and you

See UTILITY EFFICIENCY EXCHANGE, page 5

Webinar offers tribes pointers on writing renewable project proposals

Tribal lands in Western's territory hold some of the best renewable development potential in the nation. Utilities in the West have a growing need for renewable generation to satisfy their environmental goals and mandates. Yet tribes hoping to build renewable energy projects repeatedly bump up against this frustrating fact: Abundant renewable resources alone do not a successful project proposal make.

The real key to getting your renewable energy project underway is knowing how to respond to requests for proposals (RFPs). On Aug. 17, Western and the DOE Tribal Energy Program presented a webinar that examined what utilities expect in a tribal response to a renewable RFP. Challenges and Opportunities with Tribal Renewable Project Development offered a variety of perspectives on how tribes can navigate the obstacles to creating partnerships that result in successful tribal renewable projects.

Small renewable systems, like this solar array on a Navajo home, harness only a fraction of the renewable potential on tribal lands. Writing an effective proposal is the first step toward tapping those resources for utility-scale projects. (Photo by National Renewable Energy Laboratory)

Issues for everyone

Western Administrator Tim Meeks welcomed 119 participants with a brief overview of the challenges that confront renewable energy projects.

The market for renewable energy is declining now due to several factors. The biggest customer for renewable generation, the compliance market—purchases to satisfy renewable portfolio standards—has slowed down as power providers sign multi-year contracts to meet their goals, said Meeks. The sluggish economy means there is less investment in green energy and less load growth than utilities have projected. Add in the lack of a national energy policy and ongoing transmission constraints, and developers face a highly competitive climate for each project.

There are other concerns that any developer can expect to encounter in submitting a proposal. Projects must be able to meet state and Federal environmental standards. Developers should ask for a reasonable price for their energy and be able to show a strong financial plan. Also, utilities tend to prefer proven technologies and experienced partners.

Unique to tribes

Braden Houston of Citizens Energy Corp specifically cited utilities' inexperience with tribal projects as one of several obstacles tribes' proposals must overcome: Fulfilling NEPA requirements on tribal lands can be difficult, as can assuring lenders that sovereign immunity will not interfere with contract enforcement. However, tribal councils may be leery of waiving sovereign immunity, as Southern California Public Power Association requires development partners to do.

Project ownership arrangements can be a stumbling block, too, noted Randy Howard, Los Angeles Department of Water and Power. "The municipal utility usually seeks a partnership agreement while tribes prefer to retain full ownership," he said.

On the positive side, the advantages of working with tribes include dealing with one entity instead of an ever-changing cast of companies and stakeholders. Also, tribes can be eligible for grants and loans that are not available to private developers.

Cost of moving power

Many of these issues are the "cart"

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Webinar *from page 4*

that must be hooked to the "horse" of transmission access—an apt metaphor, since transmission moves the generation to the load center.

Utilities issuing RFPs will have many questions about transmission and related issues that a pre-feasibility study can clarify if not answer, said Jim Charters, Western States Energy Solutions, LLC. "The study can also help tribes get a handle on the details of the project they want to propose," he explained. "The more specific the developer can be about such details as the location and size of the project, the firmness of the delivery and whether it is on or off peak, the more likely the proposal will receive serious consideration. Utilities like specifics."

A study will also reveal some of the costs involved in developing a project. Charters pointed out that projects incur a lot of processing and permitting expenses just to show that a power purchasing agreement can be bid. Transmission service adds still more cost, from network upgrades for interconnection to the ongoing cost of wheeling, or moving power to a new line. All these expenses will factor into the utility's evaluation of a tribal proposal.

Steps to success

Tribes need a thorough understanding of not only transmission issues, but also market conditions going into the RFP process. "Your proposal will be competing against lots of other projects, and developers will go with the cheaper project," Houston said. "You have to look at all the ways to minimize costs."

The speaker urged attendees to keep an eye on the big picture and not get bogged down in relatively small points. Focusing on the little things can add months to development, exposing the project to market and policy changes.

Partnering with an experienced developer may be the best way for tribes to move a project forward, especially a first one. The outside party can help contribute additional perspective and negotiate the steep learning curve of the renewable industry.

In case you missed it

With so much information to absorb about creating successful renewable energy proposals, it was no surprise that "Are the presentations going to be online?" was the most-asked follow-up question. If you missed the webinar, or just want more details, you can download the presentations from the Public Renewables Partnership.

For links to more resources, visit http://ww2.wapa.gov/sites/western/es/pubs/esb/Pages/esb3.aspx

Utility Efficiency Exchange *from page 3*

may be surprised what the sessions cover.

As at previous Exchanges, the presentations on the final day look into the future. Speakers from Bluepoint Planning, GEO and Electric and Gas Industries Association discuss how insights gleaned from past energy-efficiency programs shape the creation and direction of new ones. The last half-hour of the program is reserved for late-breaking news, because one thing that stays the same in the utility industry is that it just keeps changing.

Not strictly business

If you have attended the RMUE Exchange in the past, you know that what goes on before, in between and after the sessions is just as important as the sessions themselves. Attendees meet the speakers, brainstorm ideas and form new partnerships over meals, breaks and receptions. You may also gain a few pounds if you don't take advantage of Aspen Meadows Resort's fitness facilities.

Join Energy Services, Aspen Municipal Utilities and sponsors Platte River Power Authority with Longmont Power & Communications, Loveland Water and Power and Fort Collins Utilities for this fun and informative event. Register for the Rocky Mountain Utility Efficiency Exchange today. Rooms at the block rate of $145 per night may still be available, but don't wait to reserve yours. It's not just for Colorado anymore.

For links to more resources, visit http://ww2.wapa.gov/sites/western/es/pubs/esb/Pages/esb2.aspx

Technology Spotlight:

Are LED T-8 replacements the best option for lighting retrofits?

The recent and coming restrictions on the manufacture of T12 fluorescent lamps and ballasts are prompting many facilities managers to upgrade their lighting.

Basically, they have three choices:

1. Stick with the standard fluorescent technology, but upgrade to the newer T-8 technologies.
2. Upgrade to LED technology, using T-8 tubular lamp replacements.
3. Upgrade to LED technology, using LEDs that fit into the existing fixtures.

T-8 upgrades

Replacing T-12 fluorescent lamps with T-8s is a straightforward change requiring a modest investment. This upgrade will significantly reduce energy use and will probably provide better lighting than your existing system.

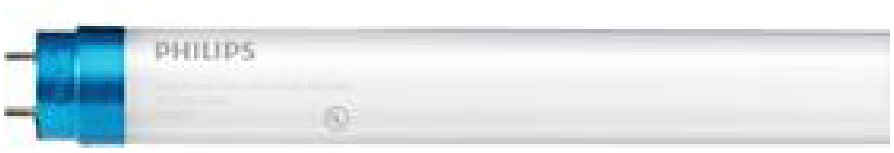
LED T-8 replacements

Most LED replacement lamps for fluorescent fixtures are tubular T-8 replacements. These are appealing because you can often use your old fixtures with the new LED technology, reducing the cost and disruption of replacement.

Selecting appropriate LED lighting is not like choosing other products. Cost, quality, energy savings and lamp life are the major issues.

Cost: The first cost of tubular LEDs is high – $50 or more per lamp.

Quality: Color quality is far from consistent among LED products. The most efficient LEDs tend to have high color temperatures that are perceived as bluish, but most people prefer indoor lighting to be in warmer tones. See the following publications from the DOE: Energy Efficiency of White LEDs, Comparing White Light LEDs to Conventional Light Sources and Color Quality of White LEDs.



LED T-8 replacement lamps can be installed in existing fixtures, but lamp cost, light quality, energy savings and life expectancy need to be factored into the purchasing decision. (Photo by Phillips)

Energy savings: Most LEDs produce a fraction of the light of the fluorescent lamps they replace. LEDs are very directional, so all of the light is directed to the task. But this directional nature of LEDs also makes it hard for these lamps to achieve a light distribution similar to fluorescents. Modern fluorescent fixtures distribute the light broadly to avoid producing a gloomy environment, as happened with many of the older fixtures. Lower light levels, particularly for computer users, are promoted by today's energy codes and are easily achieved with fluorescent products at much lower cost. You will need more watts from the LED product to produce the same light output and distribution as from fluorescents.

Life expectancy: The long lamp life (and implied reduced maintenance) attributed to LEDs has not yet been proven in real-world applications. Early claims of 100,000-hour lamp lives are probably not realistic; 35,000-50,000 hours are now more common. Furthermore, the driver that powers the light is currently the weak link in the LED system, with an average life expectancy of around 25,000 hours. Because these drivers are integral to the LED product – and cannot be replaced separately – the effective life of the tube is limited to 25,000 hours. In contrast, modern T-8 fluorescent technology with programmed start ballasts last at least 42,000 hours and the ballast can be replaced independent of the lamps.

These DOE factsheets provide more detail:

- LED Replacements for Four-Foot Linear Fluorescent Lamps
- LED Performance Specification Series: LED T8 Replacement Lamps
- Using LEDs to Their Best Advantage

The Lighting Research Center's Alliance for Solid-State Illumination Systems and Technologies Program

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For links to more resources,
visit http://ww2.wapa.gov/sites/western/es/pubs/esb/Pages/esb4.aspx

Website of the month:

Green Manufacturers Network www.greenmanufacturer.net

Suppose, having captured the low-hanging fruit of energy-efficiency, one of your large key accounts decides that boosting the company's sustainability across the board would be even better for business. Are you, the power provider, prepared to build on that customer's energy successes and further your own education about sustainability measures in the commercial and industrial (C&I) sector?

Utilities have a direct interest in ensuring that large C&I customers use energy and water wisely, but the benefits of supporting "greener" manufacturing go beyond load management. Companies that are committed to reducing their environmental footprint can be a source of innovation and a resource on technology and strategies that could help other customers. It is easier to persuade a company to invest in efficiency and sustainability when you can point to a neighbor's success—and maybe even tour the facility.

Helping industrial customers to reduce waste and inefficiency can be tricky, since there are so many types of manufacturing. The Green Manufacturers Network is a good place to begin exploring the wide range of solutions, equipment, best practices and training that can help make manufacturing more environmentally friendly.

Magazine

The Green Manufacturers Network is an online commercial publication that covers process applications that help manufacturers run effective, sustainable operations. A sample of the technologies the magazine features includes:

- Energy systems
- Waste management
- Sustainable packaging
- Eco-friendly cleaners and/or lubricants
- Sustainable building materials
- Energy efficient lighting systems
- LEED certification
- Heating/cooling systems

Subscription is free to U.S. residents in the manufacturing and related energy fields. A print version is available, or you can receive the more sustainable digital version. Even if you choose not to subscribe, you can still read featured articles online and offer comments.

(Artwork by Green Manufacturers Network)

…And more

Links to the featured content, along with a wealth of information on industry news and events, appear on the home page. One particularly interesting section, "Greenovations," lists products that can help reduce energy use in a variety of manufacturing processes, as well as general applications, like lighting.

The events calendar is as broad as the products list, and does not have a sorting function. Visitors who are new to green manufacturing should take time to browse the calendar, as they may learn about events they wouldn't see posted elsewhere.

In the navigation bar along the top of the home page, there is a button labeled "resources" that offers a drop-down menu instead of linking to another page. The links in the menu lead to reports and other websites, mostly of non-profit organizations and government agencies.

Word to the wise

Although the Green Manufacturers Network offers a searchable suppliers directory, it does not appear to have any screening process. Vendors are able to register as "green" businesses without having to verify their claims.

That being said, there is still plenty of valuable information to be found on this website. Just keep in mind that the Internet is the place to start, not end, your research.

For links to more resources, visit http://ww2.wapa.gov/sites/western/es/pubs/esb/Pages/esb5.aspx

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(ASSIST) provides more information on LED performance and applications. For safety issues, see Safety guidelines for installation of retrofit luminaire conversion kits and watch the free, on-demand webinar, Trust and safety – LED retrofit applications.

Replacement Kits

Retrofit kits for using LED lamps in fluorescent fixtures are entering the market this year. Manufacturers of fluorescent fixtures have designed reflectors to enhance the performance of the LED unit and diffusers/lenses to enhance light distribution and hide the light source from view. These kits are tested for the UL listing in the fixtures they are designed for, but no others. Cooper Lighting offers a brochure on retrofit kits for 16 of their most popular T8 fluorescent fixtures and other manufacturers are sure to follow.

Additional Information

Incentives for using LED retrofit lamps: The Federal Commercial Lighting Tax Deduction requires an IRS ruling about which products qualify for financial incentives, and most utilities do not include these products.

Utility rebates: The Design Lights Consortium maintains a list of qualified products for utility rebates and lists the specifications they must meet. No qualifying LED products in this category currently appear on this list.

Lighting Facts Label for LEDs: The Quality Advocates program offers the Lighting Facts Label for LEDs. This list includes 23 linear replacement lamp products with color temperature under 5000 degrees Kelvin and a color rendering index (CRI) at 80 or above. The label is based on tested data about several aspects of the products, but may not provide enough data upon which to base your purchase decision.

Before committing to a large purchase of LED products – especially tubular retrofit products – test a few in your application to make sure they provide the light you need before making a decision.

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